Membrane-Deformation Mapping Technique for Evaluation of Bioprosthetic Heart Valves

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Technology description

Invention Description:
The present invention is a method and apparatus for 3D deformation mapping of tissue valve’ s leaflet that does not require contact with the valve. This combination provides aimage-based measurement technique based on digital image correlation combined with high-speed stereo imaging to measure the transient three-dimensional deformations of the heart valve leaflets.
Background:
Bio-prosthetic heart valves (BHV’ s) are routinely used as replacements for diseased natural valves. Their lower risks of thrombogenicity and superior hemodynamics, when compared to the mechanical valves, have given these valves remarkable advantages. However, BHV’ s do not have a favorable long-term durability, primarily due to early structural failure of the leaflets. Although a range of failure mechanisms have been proposed to explain observed leaflet failures, most investigators agree that mechanical stress during valve operation plays a significant role.

Application area

Evaluation of the structural health of BHV’ s non-invasively
3D mapping of bio-prosthetic heart valves prior to and post-implantation
Identification of weak regions of a valve leaflet
Non-invasive evaluation of valves prior to being released for clinical use
Detection of functionally defective bio-prosthetic valves that appear flawless

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